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Subsequently Ingenitzky,⁵ a student of Professor Cholodkovsky's, made a much more detailed study of these glands and distinguished them clearly from the trichogens, the enlarged hypodermal cells which give rise to the hairs.

It seems, then, very clearly established that the so-called aerophores have no function of rendering the larvæ more buoyant, but are really *toxophores*, as Cholodkovsky proposed to call them. The rôle of rendering the larvæ more buoyant may much better be ascribed to the long, thin hairs which, as the Russian observer points out, have an unmistakable resemblance to the pappus of some plant seeds.

WM. A. RILEY

SPECIAL ARTICLES

IS THE BIENNIAL HABIT OF *ÆNOTHERA* RACES
CONSTANT IN THEIR NATIVE LOCALITIES?

THE recent article¹ on "*Ænothéra* and Climate," by R. R. Gates, is of particular interest to me since, for the past few years I have had in culture several of the races of *Ænothéra* "*biennis*" from the vicinity of Ithaca, N. Y. Two (possibly three) of these races which are predominantly biennial in character have in culture in their native locality produced annual individuals. In one case (No. 2, *Ænothéra nutans*) the seed was planted during March, 1911, and in May the boxes were kept in the garden with one transplanting until June, when they were transplanted in the open garden. From the experiences of the season of 1912, these rosettes of 1911 started in the greenhouse in March were not so far advanced as they would have been had the seed been planted in the open garden in April. Three out of about 50 or 60 came into flower early in September. Rosettes of the intermediate stage were well formed in August but these three individuals did not form the dense rosettes so characteristic of the others in late autumn. Two of these September flowering individuals were potted and taken into the

greenhouse, where they flowered all winter. In the spring they were removed to the garden and kept in their pots, where they continued to flower until some time in August, thus flowering continuously for eleven months. Another race (No. 1, *Ænothéra pycnocarpa*) under the same conditions remained strictly biennial.

In a third race (No. 17) seed was planted directly in the garden in the early spring of 1912. Eight or ten out of about 200, without the formation of rosettes, came into flower in August, matured seed and died. They were strictly annual. The others are now in the rosette stage.

In another race (No. 16), possibly identical with No. 2, the seed was planted directly in the garden on the same day as No. 17. Out of about 300 individuals one did not form a rosette. It came into flower in August, formed seed and died late in September. This individual was annual, but it remains to be seen if it is a mutant from this race, which can not be determined before the rosettes of the other individuals now passing the winter have come into flower.

From my experience in the culture of *Ænothéras*, which is not extensive it is true, I have come to the conclusion that their behavior as to a strict biennial habit even in their native locality may be different under culture either in the garden or greenhouse from what it is in the open under feral conditions. Fully formed rosettes potted in the autumn and taken into the greenhouse, kept there during the winter and removed to the garden in the spring did not form stems nor come into flower any earlier than those which wintered in the garden.

Another feature of considerable interest which has appeared in connection with some of my cultures may be mentioned here, but an account of the more important results are reserved until after another season's experiences. The feature to which I refer is the possibility of certain races of *Ænothéra* becoming perennial or of taking on a perennial habit under certain conditions. Several plants of *Ænothéra nutans* which matured in

⁵Ingenitzky, I., "Zur Kenntniss der Drüsenhaare der Nonnenraupe (*Ocnèria monacha*)," *Horæ Soc. Ent. Rossicæ*, XXX., pp. 129-134, pl. VIII., Figs. 9-11, 1896.

¹SCIENCE, N. S., 37: 155, 156, 1912.

late August and early September, were observed during late September and early October, after prolonged rains, to be putting out new branches which came into flower. Some of the stems of those which were dead formed distinct and strong rosettes from the root stock as lateral branches. If these survive the winter the rosettes will probably form stems and the plants will come into flower a second season, that is, the third season from the rosette stage. It would then be a perennial with the habit of a perennial root stock and annual flowering shoot. Several of the individuals which were putting out new branches in late September and early October were potted in early November and removed to the greenhouse where they have continued to produce new shoots, often slender and crowded, sometimes suggesting "witches' brooms." These branches arise from the old brown stalk which to all external appearance one would consider dead but on cutting the stem chlorophyllaceous tissue is seen. The very dark sky during December and January has been unfavorable for growth or flowering, and perhaps accounts to some extent for the spindling growth and lack of flowers during this period. On some of these plants the new growth occasionally wilts down, indicating perhaps that the old stems are somewhat deficient in conduction. After reading Mr. Gates's article (Jan. 24, 1913) I stepped into the greenhouse to see my perennial *Oenotheras* and lo, there was one flower.

This plant (of *Oenothera nutans*) continued to flower in the greenhouse until the middle of April when it was transplanted into the garden. The cold weather following proved to be too great a change from the warm air of the greenhouse and the stems died to the ground, but a small rosette which had formed from the root stock remains alive to this day (May 2). Three of those individuals which formed rosettes during the autumn and were kept over in the garden or in a cold frame have been transplanted to the garden. They are doing well and will probably produce stems and flowers this summer. These individuals, therefore, of *Oenothera nutans* have taken on a perennial habit.

These two species, No. 2, *Oenothera nutans* Atkinson and Bartlett, and No. 1, *Oenothera pycnocarpa* Atkinson and Bartlett are described in the May number of *Rhodora*, 1913.

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THE LOWER CALIFORNIA PRONGHORN ANTELOPE

THE Pronghorn of Lower California has recently been separated by Mr. E. W. Nelson as a sub-specific race. (*Proc. Biol. Soc. of Wash.*, Vol. 25, page 107.) The characters given have to do mostly with color and color pattern, while the horns are mentioned as shorter, rougher, more upright and less diverging than in either of the other forms, *americana* and *mexicana*. No mention is made of skull characters.

A fine series of six adult males and several females were recently sent to me from California, L. C., the type locality of the new form. One of these males is now in the collection of the Biological Survey at Washington; the others are in the Museum of Comparative Zoology.

I have not compared the skins of these specimens, but careful measurements of the six skulls do show a real divergence when compared with five large male specimens from the Laramie Plains, southeastern Wyoming, in the Museum of Comparative Zoology. They are on an average longer in the face, and considerably narrower. The most significant measurements are: length of nasals, length of anterior nares, and smallest width between orbits. The nasal length of the California animals runs from 101 to 110 mm., while the Wyoming specimens show from 84 to 97 mm. Likewise the width between orbits scarcely overlaps in the two series. An arbitrary index of nasal length plus length of anterior nares, divided by width between orbits, gives for the *peninsularis* series 1.73, and for the *americana* series 1.51.

The occipito-nasal length is very much more uniform in the series of *peninsularis* than in that of *americana*, and is somewhat greater.